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# UNITED STATES AIR FORCE (USAF)

# TECHNICAL DATA SOLUTIONS (TEDS)

# RETURN ON INVESTMENT (ROI)

# STUDY AND ANALYSIS

PRICEWATERHOUSECOOPERS

# Table of Contents

# I. EXECUTIVE SUMMARY

Implementation of Technical Data Solution (TeDS) at Oklahoma City-Air Logistics Center (OC-ALC) has already yielded impressive returns in the two months since the system went live on October 20th, 2000. The report contained herein gives a detailed explanation of the benefits associated with this implementation and provides an estimate of returns associated with this investment over time. The TeDS returns on investment are categorized in this analysis according to the following three goals:

## A. Operations

**Goal**: To operate more efficiently, while maintaining compliance with government initiatives and FOIA responsibilities.

**Return**: Returns will be measured to coincide with the specific operational goals, specifically the elimination non-value added time in the procurement process.

## B. Financial

**Goal**: To invest in a program that provides the government a high financial return on its initial investment and promises to continue to save money over time.

**Return**: Quantifiable financial returns will be determined, and expressed in terms of Net Present Value (NPV) of future returns or savings as well as a percentage return on investment.

## C. Customers and Users.

**Goal**: To implement a new, more efficient process that also increases the satisfaction of internal and external customers.

**Return**: The perspectives of the different stakeholders using TeDS will be expressed in terms of improvement to user-specific functions and operations

This report provides both qualitative and quantitative data highlighting the OC-ALC's returns on its initial investment in the TeDS system.

From the operations perspective, TeDS has made the procurement process at OC-ALC more efficient. The process not only saves the government money by reducing the costs of inventory, but implementation of TeDS has also helped to align the ALC with federal government initiatives such as increased business-to-government relations in the e-environment. In addition, providing online information to vendors helps the ALC easily and cost-effectively meet its responsibilities vis-à-vis the Freedom of Information Act (FOIA), 1986 Pub. L. 99-570.[1] The efficient new process also provides returns in the form of increased security and quality. The financial return is where TeDS boasts its greatest value to DoD and OC-ALC. TeDS yields huge financial benefits, approximately 7.34 million dollars

[1] http://www.usdoj.gov/04foia/04_3.html

at OC-ALC alone. Based on an investment to date of 1.73 million dollars, this translates into an ROI of 424%. More detailed information on the financial benefits of TeDS implementation at OC-ALC is contained herein in the results section of the report.

Customer/ User perspectives show that this program is also serving to improve the procurement process at the ALC in ways that are not always quantifiable. These benefits are explained by documenting the opinions of the current owners of the procurement process. They support TeDS because it facilitates their present tasks. Support from these internal stakeholders benefits the ALC by ensuring increased efficiency of the process, and can also help DoD boost employee satisfaction thereby reducing turnover rate. Although we have not been able to associate numbers with this benefit, maintaining a steady workforce can add even more cost savings by reducing the costs of hiring and training new employees.

Each of the three goals and associated returns for the implementation of TeDS is explained in greater detail in this report. The analysis also extrapolates the returns associated with long-term implementation of TeDS at OC-ALC, however, we do not extrapolate what the returns would be if this system were to be implemented at Air Logistics Centers across the country. Based on these results, we can hypothesize that implementing TeDS at other Air Logistics Centers would provide the Air Force a large return on investment.

# II. INTRODUCTION

## BACKGROUND

As part of the overall effort to increase business-to-government relations, both the present and future Administrations agree that the federal government must use the Internet to create e-commerce for government. This e-government push was first outlined by Vice President Gore's National Performance Review (NPR), which insists on streamlining government business processes thereby ultimately reducing costs. The procurement process was one of the focuses of the Vice President's report; in order to achieve the most efficient procurement infrastructure, decision making must be promoted at the "lowest possible level," and commercial practices must be instituted to foster the competitiveness necessary to open the doors to more savings. Consistent with the push to automate an increasing number of government processes, and move them online where possible, the Secretary of Defense, William Cohen, identified Paperless Contracting as a major goal for the federal government.

The President also issued a memorandum on Electronic Government in 1999[2] to the heads of executive agencies and departments directing government officials to recognize the "unique nature" of the Internet. The President urged the federal government to understand that "competition and increased consumer choice should be the defining features of the new digital marketplace." This is an initiative that has been supported by the new administration and promises to transform government business processes in the near future.

Using this innovative technology and new media for government processes carries other benefits for the federal government as well. In addition to increasing efficiency, placing more information on the Internet helps the government comply with the responsibilities outlined in the Freedom of Information Act (FOIA), 1986 Pub. L. 99-570. It also allows the government to better track sensitive but unclassified (SBU) data, ensuring that this information is released only to the appropriate parties. By moving this information to an e-environment, the government is able to make the process more secure.

## THE AIR FORCE TECHNICAL DATA SYSTEM (AF TEDS)

The Technical Data Solution (TeDS) is an online technical data package (TDP) request and dissemination solution for the Air Force Air Logistics Centers (ALCs). AF TeDS utilizes proven industry best practices to provide a system infrastructure to support the reliable and secure transmission, storage, and dissemination of AF TDP's.

TeDS provides several benefits to the OC-ALC. These include:

[2] http://www.npr.gov/initiati/it/index.html

- Providing a work flow management capability;
- Allowing the Air Force engineering and acquisition communities to streamline the way in which they manage requests for TDP dissemination;
- Helping the ALC move in the direction of adopting industry best practices as well as reducing inventory costs and the lengthy cycle time requiring unnecessary inventory levels;
- Helping the ALC align with the initiatives put forth by the federal government;
- Helping to streamline the DoD procurement process thereby reducing costs;
- Moving information online, making a bold step towards Paperless Contracting, ultimately increasing customer satisfaction;
- Helping the ALC meet its FOIA responsibilities, and through an established firewall, helping the ALC better track and limit access to SBU data; and,
- Increasing the level of quality of DoD data that is sent to vendors, as well as increasing the level of quality control over the entire procurement process.

# III. PURPOSE & GOALS

The PricewaterhouseCoopers (PwC) Project Management Team for TeDS was tasked with calculating an estimated Return on Investment (ROI) based on the results from the pilot implementation of TeDS at OC – ALC. TeDS promises to yield a significant ROI to the DoD Procurement Activities at the ALCs, the Vendor Community, and eventually DoD as a whole. Independently validating the ROI for TeDS is important to establish credibility among its potential user community, and determining the strategic value of the initiative. Based on this ROI study, DoD will determine the extent of future implementation of TeDS. PwC has established a methodology for the ROI for this pilot program. The methodology is comprised of two distinct sections, one outlining the investment required to insure the success of TeDS and a second to describe the potential returns on these investments.

The returns associated with the current ALC technical data dissemination processes will be measured using proven PwC Activity-Based Costing (ABC) Methodology as a guideline to conducting pilot site ROI analysis. Based on the initial investments made by DoD, this study will highlight the benefits of implementing TeDS at OC-ALC.

It is important to note that neither TeDS nor this study can promise that the Return, i.e. these savings, will be realized. In order to reap the benefits of full TeDS implementation and realize these returns, DoD has certain responsibilities that must be fulfilled.

This study evaluates the TeDS pilot implementation according to three goals, which are detailed below. In Section V, we provide a detailed analysis of exactly how TeDS will help the ALCs realize these goals.

## GOALS

**A. Operations**. To operate more efficiently, while maintaining compliance with government initiatives and FOIA responsibilities.

**B. Financial**. To invest in a program that provides the government a high financial return on its initial investment and promises to continue to save money over time.

**C. Customers and Users**. To implement a new, more efficient process that also increases the satisfaction of internal and external customers.

# IV. METHODOLOGY

This study is an independent analysis with a detailed methodology and pool of resources. It is designed to calculate, with the best available information, an estimated ROI for full implementation of TeDS across DoD. This study looks at the estimated cost-savings from implementation of the TeDS at OC-ALC. There are two reasons why the calculation must be labeled and considered "estimated." First are the costs and savings associated with the dissemination of technical data that vary greatly across procurement activities as well as across time. Each procurement activity has a different way of reproducing and disseminating its solicitations and associated technical data packages. Second are the costs and savings associated with technical data package dissemination, change with technology, customer demands, and DoD directives. It would be ill-advised for us to assert or for anyone to assume that these costs and savings hold true forever. For this reason, these calculations must be interpreted as only estimations of the ROI for TeDS implementation at OC-ALC.

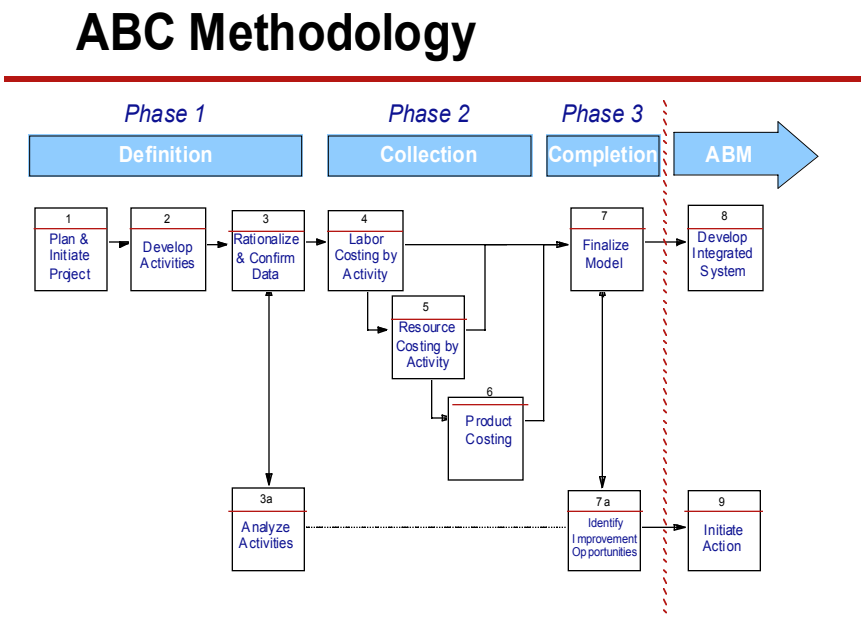
## ACTIVITY-BASED COSTING (ABC)

ABC arose from the need to analyze the costs associated with business functions and processes in a more useful manner than traditional accounting methods provided. ABC identifies costs according to the activities (i.e. the real business functions) incurring these costs, rather than simply attributing costs to organizational or even functional units. This enables management to initiate more effective and focused improvement initiatives.

ABC provides a better understanding of the cost drivers across an organization. While traditional accounting only looks at expenses by category, ABC breaks down costs according to steps in the core business process. The sum of the costs therefore is the cost of a given process. While traditional accounting and ABC will arrive at the same number for total cost, the latter tells a better story about the operations of an organization. The following table demonstrates this major difference between traditional accounting methods and the ABC methodology.

| Traditional Accounting View | | Activity View | |
|---|---|---|---|
| Salaries | $500,000 | Prepare work plans | $ 30,000 |
| Telecommunications | 100,000 | Facilities and personnel planning | 30,000 |
| Enforcement expenses | 50,000 | Mail receipt and sorting | 50,000 |
| Facilities | 30,000 | Document and data preparation | 180,000 |
| Travel | 20,000 | Data entry | 40,000 |
| | | Document and security control | 130,000 |
| | | Data reconciliation | 90,000 |
| | | Taxpayer file maintenance | 110,000 |
| | | Refund requests/ correspondence | 40,000 |
| **Total** | **$700,000** | **Total** | **$700,000** |

Below is an overview of our ABC methodology. While we will not necessarily follow each step or task, this study is based on this methodology. Thus, following the outline of each Phase and Task described below will be our customized approach for our Pilot Site analysis.




ABC helps to break away from the traditional approach of measuring performance within functional silos and reach a new understanding of operations based on the true cost of cross-functional processes. Our methodology, a three-phased approach to establishing baseline ABC information, sets the stage for the continued implementation of Activity-Based Management (ABM).

***Phase One*** is a definition of the initiative, ***Phase Two*** gathers all the data necessary to build the ABC model, and ***Phase Three*** allows us to finalize the model and identify improvement opportunities. The project's initial step is to mobilize the project team and educate key stakeholders on the ABC initiative. Overview briefings communicate the project plan to managers and clarify expectations on the project execution and outcomes. Managers need to understand what ABC can provide for them and how their people will be expected to collaborate with the project team. By defining high-level business processes and product lines, the project team moves toward completing the detail needed for an ABC model. As with ABC initiatives, the ROI analysis for TeDS requires a phase for definition, data gathering, and model building.

## TASK 1: PLAN AND INITIATE PROJECT

In Task 1, the project team begins by receiving training in the overall methodology and works with PwC consultants to develop a detailed work plan. As part of this training, PwC walks participants through an interactive ABC case study based on an actual ABC engagement. This approach, which provides hands-on decision-making by participants, illustrates ABC theory with practical applications.

The team reviews the organizational structure to determine the appropriate cross sections for interviewing and gathering of activity information. They then brief middle management and schedule employee awareness briefings. The work plan developed by the team outlines specific actions critical to both the project's success and the ongoing acceptance of ABC.

### *Application to TeDS ROI*

The PwC ROI team has been trained in our ABC Methodology and has had extensive exposure to ABC engagements, approaches, and strategies.

The critical first step to our ROI study was familiarizing pilot site personnel with the principles of ABC. Without this understanding, addressing the following tasks would have been ill advised. The context and overview of ABC was explained, as well as its relevance to our ROI initiative.

In maintaining the scope of the ROI initiative, it is important to keep in mind that we are using ABC as a tool to achieve our goal—the ROI calculation. The intent of our study is to use the principles of ABC to calculate a ROI for implementation of TeDS at OC-ALC.

Following initial conversations with management at the pilot site, the ROI team determined which areas and which supervisors must be interviewed for data collection, and meetings were scheduled accordingly. Because this study had to be conducted over a short period of time, determining the appropriate personnel with who to speak was a challenging task. The ROI team worked very closely with the pilot site TeDS managers to evaluate these decisions, putting all the information from the site visit interviews in the appropriate context to evaluate the program.

## TASK 2: DEVELOP ACTIVITIES

The ABC team begins by examining business processes defined by the senior management team. This effort provides focus and direction and sets the framework for the project. The team analyzes any existing process and activity information in detail to determine applicability to the activity model and conducts activity development sessions to develop a hierarchical activity structure. During these sessions, the team members identify activities, the processes they involve, and products and outputs. They begin developing a high-level top-down flow chart of processes and linkages to business processes. In addition, a list of products is reviewed for data collection in Task 6 of the work plan.

Following these sessions, the team focuses on reviewing and validating the information developed with other members of the organization. Working with organizational representatives, the team develops task-level detail to support activity definitions and develops a dictionary that defines the boundaries and purpose of activities. This information-intensive task is a joint effort between the project team and the organizational areas to ensure not only accurate activity definition but also validation and acceptance by the process owners.

### *Application to TeDS ROI*

The TeDS ROI team met with the management of technical data and procurement activities at the pilot site. These representatives provided focus and direction as to understanding the scope of the full procurement life cycle and the role of TDP activities in this larger picture. Due to the narrow scope of this analysis, management was able to provide detailed process, activity, and task information. The result of these interviews was a clear understanding of the scope and definition of TDP activities within the full life cycle of procurement.

Once the ROI defined the gathered data in the context of Phase I TDP Activities, they required validation and acceptance from the functional organizational representatives. Developing a clear and accurate understanding of the TDP activities at the Pilot Site is the joint responsibility of the ROI Team as well as the Pilot Site representatives.

## TASK 3: RATIONALIZE AND CONFIRM

The team works to refine and further develop the initial activity list. The team normalizes the language of similar activities and develops a dictionary that defines the boundaries and purpose of activities, building on the expanded information collected through validation. During this stage of the project, the team works to ensure the activities fit into a logical hierarchy, representing all core business lines.

The team identifies activity drivers—the means through which activity costs will be traced to products—and product output measures. These measures and drivers are essential to tracing costs in the ABC model. If a driver cannot be identified, the associated activity must be reviewed for possible rewording or consolidation with other activities.

Final activity validation takes place at the end of this task. This information-intensive task is a joint effort between the project teams and the divisions to ensure accurate activity analysis and

validation and acceptance by the process owners. The activity structure is loaded into the ABC model.

***Application to TeDS ROI***

Because of the limited scope of this study, there was no need to develop either an activity dictionary or to normalize activities across organizations. The model around which activities were identified, captured, and grouped remains the TDP activity framework defined in Phase I. Rather than creating a new grouping structure, these activities were applied to the one already developed.

The TeDS ROI team identified the activity drivers in this stage—the means through which activity costs will be traced to products—and product output measures. These measures and drivers are essential to tracing costs in the ABC model. Because the activities are applied to an already-developed framework, there is less difficulty in identifying activity drivers associated with the TDP Activities.

## TASK 3A: ANALYZE ACTIVITIES

This task is performed in conjunction with the Rationalization & Confirmation task. Team members hold a workshop to conduct the attribute analysis. The team receives specific training at the beginning of the workshop to become familiar with the terms and concepts that will be used (value-added, cost of quality, etc.). In addition, the team determines other information, such as cost drivers, that needs to be collected during Tasks 4 and 5.

***Application to TeDS ROI***

This task sets the stage for Activity-Based Management, which is not the end-goal of this ABC study. However, the team further verified and identified activity and cost drivers at this stage to get a firm understanding and preparation before beginning the costing analysis of Tasks 4 through 6.

## TASK 4: LABOR COSTING BY ACTIVITY

Task 3 must reach completion with the validation of activities by managers before data collection regarding labor costing. Although an ABC model evolves over time, it is critical to identify this point of closure in the activity definition so that the data collection can move forward uninterrupted.

The project team works with organizational areas to identify labor resource pools. These resource pools will complete activity data collection forms to determine initial activity and process costs. Cost information is loaded into the model and linked to resource pools.

The team creates and distributes data collection forms and instructions and gathers the employee data. After the data is reviewed for accuracy, it is loaded into the ABC model. Labor costs are now traced and an initial cost model is established. In addition, the team gathers output volume information for activities to enable performance measure unit costing.

***Application to TeDS ROI***

With a firm understanding of the scope and definition of TDP activities throughout the full life cycle of procurement, associated labor resources were identified. Because the scope is smaller than a normal ABC study, there was no need for labor time allocation surveys or data collection forms. Most of the relevant labor allocation information was captured in conjunction with the process and activity definition from Tasks 2 and 3. Additional interviews captured additional data required at this stage. Because the relevant hierarchy is not as deep as with an entire organization, the pilot site representatives identified in Task 1 were able to supply the necessary information.

In addition to labor time allocations associated with TDP Activities, labor cost data must also be captured in this stage. This may require additional data collection beyond the previous interviews. It is imperative to have a strong understanding of the data received.

With data collected and validated, an initial cost model is created. As with the previous tasks, this model is established in the context of the TDP Activities and their counterparts at each pilot site, as defined earlier in the process. This cost model is maintained for the remainder of the study, and the resource and product costing data is integrated accordingly.

## TASK 5: RESOURCE COSTING BY ACTIVITY

The team collects and evaluates general ledger expense data to identify non-labor resources concurrently with Task 4. A driver will be selected for each resource in order to trace costs to activities. These drivers could be Full Time Equivalents (FTEs), square footage, number of units, or any appropriate measure. A collection form will be developed, similar to the one used in Task 4. It is important at this point to meet with key employees to explain the concept of resource drivers, confirm resource utilization, and obtain resource driver volume information to trace costs.

***Application to TeDS ROI***

All non-labor resources associated with the TDP activities and the labor allocations defined earlier in the process were captured, and a driver was selected for each resource. (These drivers could be FTEs, square footage, number of units, or any appropriate measure.) Resources were captured for both direct and indirect costs.

Because this ROI study focuses on TDP activities only and not the entire organization, obtaining general ledger and other expense information was not practical. With limited organization-wide exposure and buy-in, the pilot site representative acted as a liaison between the TeDS ROI team and the source of the resource and costing data. In addition, the ROI team obtained the pilot site team's input on resources associated with the identified labor allocation. There is no established model by which non-labor resources can be identified, especially across such varied pilot sites. Thus, extensive and thorough interviews, including facilitated concept analysis sessions, were conducted with the appropriate pilot site representatives.

### TASK 6: PRODUCT COSTING

The team collects activity driver information to link activity costs to products. This task can begin concurrently with Tasks 4 and 5. To avoid confusion in the data collection process, however, this task ("second stage" driver collection) will be sequenced after Task 4.

This activity driver information also serves to update future revisions to the model. In cases where activity driver data does not exist, best estimates can be made and those drivers that require a means for future collection can be identified.

#### *Application to TeDS ROI*

This stage was another verification of the data from the previous stages. Identifying the activity drivers and linking the costs to products helped to establish a framework for future data gathering or data updating.

### TASK 7: FINALIZE MODEL

The team completes the ABC model and develops summary reports on activity, process and product costs. The team will present its final results to management, interpret the ABC data, and outline the next steps to ensure ongoing success.

The team will document lessons learned and use them as action items to improve upon future data collection initiatives and revisions to the model.

#### *Application to TeDS ROI*

Upon completion of data gathering and model creation, the final results were compiled and entered into the model created for calculating the estimated ROI for full implementation at OC-ALC. The results of the pilot site study are analyzed for their own merit, and these results are used to determine the potential returns of implementing TeDS on a larger scale.

**Task 7a,** Identify Improvement Opportunities, **Task 8**, Develop Integrated Systems, and **Task 9**, Initiate Action, although not part of building an ABC model, are the initial steps to full ABM implementation, and will not be performed for the purposes of this study.

## COST-BENEFIT ANALYSIS

The PwC Cost-Benefit Analysis methodology helps evaluate the benefits achieved from various investments. While the full methodology is normally followed prior to initial investment, certain portions of it apply directly to the TeDS ROI study.

### PRESENT VALUE ANALYSIS

Present value (PV) rests on the assumption that a dollar today is worth more than a dollar tomorrow. This is because a dollar received in the future cannot earn interest until it is invested. "Discounting" calculates the present value of benefits and costs by multiplying them by a discount factor, derived from a discount rate, and applied to each year of an alternative. Discount rates and inflation rates can be obtained from OMB Circular A-94.

The following table illustrates a basic present value analysis. The one-time costs plus the recurring costs equal the total costs for the proposed alternative. Costs and benefits are shown in constant dollars (Table A) and discounted dollars (Table B). This example reflects a typical Net Present Value (NPV) analysis on a government system using a discount rate of 7%.

discount rate: 7.0%

Table A

| **Constant Base Year Dollars** | Base Year | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | |
|---|---|---|---|---|---|---|---|
| Cost Stream A (Implementation) | $250,000 | $150,000 | $50,000 | | | | $450,000 |
| Cost Stream B (Maintainence) | | $ 10,000 | $10,000 | $10,000 | $10,000 | $10,000 | $ 50,000 |
| Cost Stream C (Site preparation) | $ 20,000 | | | | | | $ 20,000 |
| **total costs** | | | | | | | **$520,000** |
| | | | | | | | |
| Benefit Stream A (Increased Throughput) | | $ 90,000 | $90,000 | $90,000 | $90,000 | $90,000 | $450,000 |
| Benefit Stream B (Personnel Cost Savings) | | $ 15,000 | $16,000 | $17,000 | $18,000 | $19,000 | $ 85,000 |
| Benefit Stream C (Fuel Costs Saved) | | $ 25,000 | $25,000 | $25,000 | $25,000 | $25,000 | $125,000 |
| **total benefits** | | | | | | | **$660,000** |

Table B

| **Present Value Dollars** | Base Year | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | |
|---|---|---|---|---|---|---|---|
| discount factor | 1.000 | 0.935 | 0.873 | 0.816 | 0.763 | 0.713 | **totals** |
| Cost Stream A (Implementation) | $250,000 | $140,187 | $43,672 | | | | $433,859 |
| Cost Stream B (Maintainence) | | $ 9,346 | $ 8,734 | $ 8,163 | $ 7,629 | $ 7,130 | $ 41,002 |
| Cost Stream C (Site preparation) | $ 20,000 | | | | | | $ 20,000 |
| **total costs** | | | | | | | **$494,861** |
| | | | | | | | |
| Benefit Stream A (Increased Throughput) | | $ 84,112 | $78,609 | $73,467 | $68,661 | $64,169 | $369,018 |
| Benefit Stream B (Personnel Cost Savings) | | $ 14,019 | $13,975 | $13,877 | $13,732 | $13,547 | $ 69,150 |
| Benefit Stream C (Fuel Costs Saved) | | $ 23,364 | $21,836 | $20,407 | $19,072 | $17,825 | $102,505 |
| **total benefits** | | | | | | | **$540,672** |

NPV = PV(Benefits) – PV (Costs) = $540,672 - $494,861 = ***$45,812***

## NET PRESENT VALUE

Reducing all quantifiable benefits and costs to present value allows an analysis in today's dollars. The most straightforward comparison is net present value. NPV is the difference between the present value of the benefits and the present value of the costs, or:

NPV = PV (benefits) - PV (costs)

In the previous table, the present value of benefits is $540,672 and the present value of cost is $494,861. The NPV is the difference, or $45,812. In other words, the quantifiable benefits for this alternative exceed costs (it makes a net contribution to value).

## RETURN ON INVESTMENT

Return on investment (ROI) is defined as the percentage return that is received from each dollar invested. Dollar return would be the same as the NPV above. Percentage return would be expressed as a ratio of the present value of the benefits to the present value of the costs, minus one, or:

ROI = [ PV (benefits) / PV (costs) ] – 1

In the table above, the ROI would be expressed as follows:

$$ROI = [\ \$540,679 / \$494,861\ ] - 1 = \textbf{\textit{9\%}}$$

That is to say, each dollar invested should result in a $1.09 return.

### DISCOUNT RATE

The factor that translates expected benefits or costs in any given future year into present value terms. The discount factor for any given year is equal to $1/(1 + i)^t$ where i is the interest rate and t is the number of years from the date of initiation for the program or policy until the given future year.

### INFLATION

The proportionate rate of change in the general price level, as opposed to the proportionate increase in a specific price. Inflation is usually measured by a broad-based price index, such as the implicit deflator for Gross Domestic Product or the Consumer Price Index (Available from the Bureau of Economic Analysis, Dept. of Commerce).

## ADDITIONAL DEFINITIONS

***Capturing Labor—The Full Time Equivalent***

We will use the notion of a Full Time Equivalent (FTE) to capture those labor allocations within the scope of TeDS. An FTE represents personnel working full time within the designated context. Thus, an FTE for a GS-10 would represent a labor allocation of a GS-10 working full time on tasks within the scope of TeDS. This does not necessarily mean that one GS-10 is working full time. It could mean that two GS-10s are working half time each, or any other combination of GS-10s adding up to one full time equivalent.
Labor allocations overseeing FTEs within the scope of TeDS are captured only when this labor allocation could likely be avoided with the implementation of TeDS. For example, if two FTEs oversee an organization in which half of the FTEs fall within the scope of TeDS, one of the two oversight FTEs falls within the scope of TeDS. However, if one FTE oversees an organization in which only a portion of its FTEs falls within the scope of TeDS, no additional oversight FTE is captured.

As defined within each section, the General Schedule of Pay for federal government workers is used to estimate the labor costs of those FTEs within the scope of TeDS, and the appropriate Locality Pay is included. A multiplier of 1.2 is used to capture fringe labor costs (including benefits) when a site-specific multiplier is not available. DoD analysts use this as a standard multiplier to capture these costs.

***Capturing Only True Returns***

This study is intended to be a very conservative measure of the DoD costs that could be avoided if TeDS were to be implemented. In this sense, the study departs somewhat from ABC methodology, capturing only those costs incurred by DoD that could be avoided by not implementing TeDS. For example, even if a small portion of an FTE oversees other FTEs

within the scope of TeDS, it is not reasonable to assume that any labor costs will be avoided with the implementation of TeDS. Oversight FTEs would not be captured here. In addition, machinery depreciation is not captured by this study. Only machinery maintenance is captured for those machines within the scope of TeDS because only these costs will be avoided with the implementation of TeDS. Although ABC and economic principles tell us that depreciation is a true cost to an organization, in order to remain conservative and focused on the scope of TeDS, we will not include these costs.

### *Indirect Costs*

The indirect costs of doing business contribute significantly to overall overhead costs. Because these costs are indirect and not associated (at least directly) with any one activity or person, these costs are distributed evenly across the personnel affected by the products and services associated with these costs. When time and resources permit and the situation calls for it, some of these costs can be weighted to affect certain activities or personnel more or less significantly. However, these indirect costs are most often exactly that—indirect.

Indirect costs capture the costs of general administration of business, information technology services, security and protection services, utilities, and general facility usage costs. The understanding of these costs is that the associated products and services are used activity-wide. If this weren't the case, the costs could and would be associated with a particular activity or functional unit and not charged to the activity as a whole.

It is important to note that these indirect costs are different from the fringe included on base salaries to compute a fully-burdened salary. These fringe costs are separate and not included in the itemization of the indirect costs.

Including this cost in our study provides thoroughness more than anything else. This estimated indirect cost will not alter the order of magnitude of the cost per person (i.e. fully-burdened salary), but rather fine-tune the figure to best capture all of the costs associated with the products and services consumed by each employee of the activity. We will not add this cost to the fully-loaded salary of each individual. These indirect costs will be included and weighted (according to the FTEs captured in the Labor Allocation section) in their own section for each activity's study.

### *Investment*

In order to realize the potential returns of TeDS, investments must be made by both the users and the sponsors of the initiative. Not every investment required by TeDS will be a monetary investment—the most crucial investment is buy-in from the DoD procurement activities. In addition, the vast majority of the monetary investment required to realize the returns of TeDS will be provided by sources other than DoD funds. Finally, several investments already made by DoD and other sources for initiatives beyond the scope of TeDS contribute to the success of TeDS. Traditional ROI thinking suggests that these costs should not be included in the ROI because an ROI analysis is intended to capture a static look at what returns could be expected if investments are made. Investments already made are essentially "sunk costs," and decisions regarding further investment should not take these into account.

### *Returns*

The returns outlined below are broken into three categories to match the goals laid out above.

**A. Operations**. Returns will be measured to coincide with the specific operational goals, specifically the elimination non-value added time in the procurement process.

**B. Financial.** Quantifiable financial returns will be determined, and expressed in terms of Net Present Value (NPV) of future returns savings.

**C. Customers and Users.** The perspectives of the different stakeholders using TeDS will be expressed in terms of improvement to user-specific functions and operations.

### *Perpetuity*

Perpetuity describes a cash flow that is expected to continue forever. A **growing perpetuity** is a continuing cash flow that increases incrementally each period, e.g. with inflation. An example of this would be an employee's salary.

## ASSUMPTIONS

The major assumption upon which this analysis rests is that DoD will allow for the necessary changes to take place in order to realize the returns made available by TeDS. These changes might include relieving procurement activities of the obligation to fulfill TDP requests, allowing changes in inventory management to reflect cycle time reductions, or granting more lee-way to procurement officers to more strategically manage contracts. Through its recent history in acquisition reform, DoD directives and initiatives are moving in this direction, and there is reason to believe these changes will take place.

It is important to understand that implementing TeDS will not immediately enable the realization of these returns. The returns identified below are in the form of costs which will be avoided once TeDS is implemented and DoD has enabled its activities to realize these returns. Financial returns are different areas of cost avoidance enabled by TeDS—those captured are only those costs that TeDS will allow DoD to avoid.

# V. RESULTS

This section details the return on investment realized by the implementation of TeDS at OC-ALC and then extrapolates this figure to determine the overall return from a DoD-wide implementation. The results are categorized according to the aforementioned categories:

## A. Operations

**Goal**: To operate more efficiently, while maintaining compliance with government initiatives and FOIA responsibilities.

**Return**: Returns will be measured to coincide with the specific operational goals, specifically the elimination non-value added time in the procurement process.

## B. Financial

**Goal**: To invest in a program that provides the government a high financial return on its initial investment and promises to continue to save money over time.

**Return**: Quantifiable financial returns will be determined, and expressed in terms of Net Present Value (NPV) of future returns savings.

## C. Customers and Users

**Goal**: To implement a new, more efficient process that also increases the satisfaction of internal and external customers.

**Return**: The perspectives of the different stakeholders using TeDS will be expressed in terms of improvement to user-specific functions and operations

For each of these areas, we have outlined the associated costs, and performed analysis to determine the returns. The estimated returns detailed below are both qualitative and quantitative in nature.

| | |
|---|---|
| **OPERATIONS** | ***Goal:*** *To operate more efficiently, while maintaining compliance with government initiatives and FOIA responsibilities.*<br><br>***Return:*** *Returns will be measured to coincide with the specific operational goals, specifically the elimination non-value added time in the procurement process.* |

## ALIGNMENT WITH GOVERNMENT INITIATIVES

Implementation of TeDS helps the ALC streamline its procurement process by moving the entire up-front process on-line. In the e-environment, this new process is paperless and more efficient. The returns on a more efficient process are numerous.

## IMPROVED CYCLE TIME AND INVENTORY REDUCTION

Implementing TeDS makes the procurement process more efficient by eliminating Non-Valued Added (NVA) Steps in the process, such as waiting. The cycle time for the old procurement process was estimated at 200 days. With the implementation of TeDS, the time required to complete the procurement process is estimated at 120 days. **This represents a 40% decrease in cycle time.**

A shorter and more efficient cycle time aligns the ALC with the initiatives set forth by the federal government. With TeDS, the new procurement process is more streamlined and therefore consistent with Vice President Gore's National Performance Review (NPR). TeDS also makes the procurement process paperless and moves the process to the e-environment; these are both initiatives supported by President Clinton and president-elect George W. Bush.

A more streamlined process yields financial returns for the ALC, by reducing inventory costs. Reductions in cycle times will allow for a reduction in inventory holds. As a process decreases in cycle time, the amount of stock needed on-hand reduces. This stock is based on the ratio of the forecasted demand over the estimated lead-time. Therefore, as lead-time decreases, the stock needed on hand decreases also. In the past, buffer stocks have been purchased as a result of slow system processes and unreliability. As processes become quicker and more reliable under electronic commerce and electronic data interchange, excess stocks can decrease. Acquisition costs can be reduced through the application of an Economic Order Quantity (EOQ) model, which incorporates purchasing costs and stock levels.

For example, inventory items are reordered as inventories are depleted below a critical level. This critical level is determined by how long it will take to receive additional items. This stockpile must suffice until the new order arrives. If this new order will arrive ten days faster, there is no need to hold inventory for those ten days anymore—the new order will be received in time.

Decreasing inventory due to decreased cycle time should not be confused with trying to reduce inventory without a reduction in cycle time. These types of reductions require a more extensive analysis of the new risks involved with process reengineering. Oftentimes these reductions come from cutting deadlines closer, whereby certainty and security can indeed be compromised. By reducing cycle time, DoD can calculate the manner by which it manages its inventory just as it does now with its current cycle times. Certainty and security are not compromised.

The following table displays several examples of industry best practices in reducing inventories due to cycle time reductions.[3] While these examples are highlights from private industry, this one-to-one relationship between the cycle time reductions and the inventory reductions is not rare. This relationship is quite normal, and inventory can often be reduced on a greater scale than cycle time reductions.

| | **Cycle Time Reduction** | **Inventory Reduction** | **Cycle Time Reduction: Inventory Reduction** |
|---|---|---|---|
| Westinghouse Electric Corporation Plant, Construction Equipment Division, Asheville NC | 50% | 70%* | 1:1.4 |
| Unisys Corporation's Government Systems Group, Pueblo Operations Plant | 75% | 60% | 1:.8 |
| Johnson & Johnson Medical Inc. | 5.6% | 6.3% | 1:1.125 |
| Dreyers Company, Edy's Grand Ice Cream | 67% | 66% | 1:1 |
| Martin Marietta Corp., Government Electronic Systems, Moorestown, NJ | 50% | 80% | 1:1.6 |
| XEL Communications, Aurora, Colorado | 91.4% in ten years | 51.8% in five years | N/A |

* *Inventory was reduced by 44% of sales, and the industry average inventory to sales ratio is approximately 1.4, yielding a 70% reduction in inventory.*

In all but one example listed above, the percentage inventory reduction at least matches the percentage cycle time reduction. In the Unisys Corporation example, Work in Progress (WIP) inventory was reduced by nearly 75%.

Our model will use a 1:1 ratio for percentage cycle time reduction and percentage inventory reduction.

[3] This data is provided by the American Productivity and Quality Center Database

The Inventory-to-Sales Ratio captures the relationship between the sale of items and the inventory held in support of those sales. Because we are able to estimate the total OC-ALC fiscal year sales of items for which TeDS will assist in decreasing cycle time, this ratio allows us to estimate size of the inventory held in support of these sales. This number will be applied to the percentage decrease in inventory determined by the cycle time reduction and the associated inventory reduction predicted by industry best practices.

The Federal Reserve Bank of St. Louis provides the inventory to sales ratios for the entire United States. Over the past fifty years, this ratio has fluctuated between 1.35 and 1.7, averaging approximately 1.45.

However, inventory to sales ratios for the Defense Logistics Agency and DoD as a whole are quite different from that provided by national fiscal analyses. Due to several factors, some of which are mentioned in this section, the DLA and DoD maintain higher levels of inventory to support their levels of sales relative to industry.

## THE COSTS OF CARRYING INVENTORY AND THE SAVINGS OF REDUCING INVENTORY

The costs associated with maintaining an inventory are significant. Traditionally, the cost of the capital tied up in inventory holds was used to calculate the costs of an inventory, but new models more accurately capture several other costs associated with maintaining an inventory.

**Cost of Capital**. The cost of capital is the opportunity cost of having money that could be otherwise invested (or not borrowed) tied up in an activity. The capital in this scenario refers to the value of the items sitting in inventory. Long-term U.S. Treasury Bonds are traditionally used to estimate the cost of tying up capital in inventory. These bonds usually have yields between 6 and 8 percent.

**Economic Depreciation**. Economic depreciation, which is distinguished from accounting depreciation,[4] refers to the loss in economic value of assets over time. This loss can be a function of both physical deterioration (exceeding the "shelf life") and technological obsolescence, which occurs when parts are no longer functionally appropriate, either because they are inconsistent with the equipment mix or because more cost-effective parts exist. The most reliable measure of economic depreciation is resale value.

**Storage costs**. Whether storage facilities are leased or owned, they generate an economic cost. In addition to the cost of land and a physical structure, storage costs include such items as heating, ventilation, and air conditioning, cleaning, and security.

**Inventory shrinkage**. Although established controls may keep inventory shrinkage to a minimum, it is a reality that whenever valuable items are kept in inventory, the possibility of theft exists. Other causes of inventory shrinkage include paperwork errors and breakage.

[4] Accounting depreciation is used primarily for tax and financial reporting purposes. The goal of corporations in accounting for depreciation is typically to maximize the amount of reported depreciation, in order to reduce their current year tax liability. Consequently, private sector book value based on accounting depreciation is an unreliable measure of an asset's value.

**Administration.** Administrative costs refer to labor and other expenses associated with tracking inventories, including periodic inventory counts.

Economic Depreciation, Storage Costs, Inventory Shrinkage, and Administration costs combined with the Cost of Capital amount to 20-40% of the inventory value. Our model will remain conservative with its estimates and assume an inventory carrying cost of 20% of the value of the inventory.

For the first year of the inventory reduction, savings also include the total value of the inventory reduced because this inventory will not need to be replaced. Thus, the first year's savings are 120% of the reduction in inventory, while the following years' savings are only 20% of the reduction in inventory. These savings, as with the 20% for carrying costs, are savings relative to the previous years' inventory management costs.

***Increased Quality and Security***

This reduction in inventory does not translate into compromised certainty or security. DoD currently has an estimated cycle time, and it orders new items and maintains its inventory accordingly. If inventory is reduced in an appropriate manner, the availability of managed goods should not change.

The relatively higher levels of inventory for DoD compared to private industry may be partially attributable to the fact that the need to insure the availability of certain items is more critical than is this need in private industry. However, it would be inappropriate to assume that this alone accounts for the difference.

Improving cycle time and, thus, decreasing necessary inventory holds does not translate to less certainty that an item will be in stock. If cycle time is truly reduced, this means that DoD can be sure to have an item in stock in a shorter amount of time once the acquisition cycle begins. This is not to say that DoD is taking more of a risk at having no stock available when a need arises. The processes that need to take place before an item arrives in warehouses determine the cycle time and the inventory needed to support the sale of that particular item. If these processes are improved and cycle time is shortened accordingly, holding less inventory does not at all change the certainty that an item will be in stock when a need arises—as long as the reductions in inventory properly reflect the reduction in cycle time.

This notion clearly manifests itself in private industry. While cycle time in industries supporting DoD activities is approximately five days, DoD averages range from around 200 days to nearly 500 days. Clearly these industries assign a great deal of importance in having items in stock when needed. Their shortened cycle time should not be interpreted as an ability to live without stock for long periods of time. In some cases, the consequences of a depleted inventory could be even greater for industry than for DoD. Thus, shortening cycle time in DoD should not be regarded as decreasing the certainty that items will be in stock when needed, and likewise lengthy DoD cycle times should not be solely attributed to the importance DoD pays to having items in stock when needed.

By streamlining the process, utilizing TeDS helps OC-ALC realize the benefits from reduced cycle time and inventory. Implementation of TeDS also helps increase the overall level of quality and security of the process. With the old procurement process, the information

contained in a TDP is burned onto a CD. This TDP would only contain the engineering drawings necessary for the solicitation; the TDP would also contain several sheets of paper that contained additional information. A buyer had to manually check one CD per batch to make sure that the data contained on the CD was consistent with the requirements. The buyer then had to print the additional sheets, create the list of contractors that should receive the solicitation, and send the package to the Procurement Office (PK) for mailing.

With the above described paper process, the are several places where the quality and security of the data may have been compromised. There are many person-to-person communications that are susceptible to human error such as those between the Data Specialists (who burn the CDs) and the buyer as well as the buyer and the PK office. There is no guarantee that just because the buyer indicates that a TDP contains SBU data that it will not be sent to a contractor who has not yet met the requirements necessary to be privy to such information. In addition, if a buyer does find an error in the information on the CD, he or she has to tell the Data Specialists who then update the information and burn a new batch of CDs.

Through the implementation of TeDS, these problems with security, quality and efficiency of the control process have been eliminated. TeDS contains all the necessary information online—the engineering drawings as well as the additional sheets of information (such as the requirements guide). Therefore, buyers and vendors have easy access to the information. Buyers have indicated that having all the information in one place facilitates the quality control process; and, if a buyer does locate an error in the information posted for a given on TeDS, he or she is able to go into the system and make the necessary changes. He or she does not have to send the request to the Data Specialists who would then make the changes and have to burn new CDs.

The new procurement process with TeDS eliminates this possibility that the information for a given solicitation will be sent to the wrong vendor, because all vendors obtain the TDPs themselves through the Internet. To access the information, a vendor must input a registered login name and password. TeDS will then load the contractor's profile, and allow only those contractors who meet the necessary requirements to access SBU data. With the new procurement process, the ALC is not at risk for possible errors with the mailing system; all of the information is transmitted through a secure server, and requires a unique identification and password.

| | |
|---|---|
| **FINANCIAL** | **Goal:** To invest in a program that provides the government a high financial return on its initial investment and promises to continue to save money over time.<br><br>**Return:** Quantifiable financial returns will be determined, and expressed in terms of Net Present Value (NPV) of future returns savings, as well as a percentage Return on Investment (ROI). |

While TeDS results in numerous operational savings, the bulk of the quantifiable returns will come from reduction or elimination of labor and cost elements throughout the procurement process.

This section explains the cost savings realized by TeDS implementation at OC-ALC. These savings are estimated for OC-ALC only, and show how the TeDS helps this ALC save money over time.

## COSTS

Determining the costs of implementing and maintaining TeDS is relatively simple. Costs can be broken down into the following categories:

***Development and implementation***

The total cost of development of AF TeDS and implementation at OC-ALC is estimated to be $435,000. This is a non-recurring cost, and includes labor and other costs directly associated with development.

***Hardware purchases***

This costs is a result of initial purchases (specific to TeDS) and future necessary purchases for the maintenance of TeDS. These costs assume a 5-year replacement schedule in perpetuity.

| Item | Unit Price | Present Value* |
|---|---|---|
| Hardware | $117,632 | **$292,216** |

* *Per OMB Circular A-94, PV is calculated using a 7% discount rate. Where applicable, a 3% inflation rate is utilized.*

### *Maintenance*

Maintenance costs have been estimated to be $25,000 annually, growing with inflation in perpetuity.

| Item | Unit Price | Present Value* |
|---|---|---|
| Maintenance | $25,000 | **$625,000** |

* *Per OMB Circular A-94, PV is calculated using a 7% discount rate. Where applicable, a 3% inflation rate is utilized.*

### *System Administration*

System administration costs are estimated to be one-quarter of a GS-12 FTE, recurring and growing with inflation in perpetuity. Present value of this cost is as follows:

| GS-Grade | Base Salary* | Fully-Burdened** | Total Allocation | Present Value*** |
|---|---|---|---|---|
| GS-12 | $50,388 | $60,466 | 1/4 FTE | **$377,910** |

* *Salaries are taken from the General Schedule using Step Five for each grade, and the salary is adjusted by the "Rest of U.S." Locality Pay.*

** *The OC-ALC fully-burdened salary was estimated to use a 1.2 multiplier to capture all fringe and benefits costs for OC-ALC personnel.*

*** *Per OMB Circular A-94, PV is calculated using a 7% discount rate. Where applicable, a 3% inflation rate is utilized.*

All of these costs can be summarized as follows:

| Cost | Present Value |
|---|---|
| Development | $435,000 |
| Hardware | $292,216 |
| Maintenance | $625,000 |
| System Administration | $377,910 |
| **Total** | **$1,730,126** |

## RETURNS / SAVINGS

The major quantitative gains associated with TeDS are the reductions of labor and cost elements as a result of the new system and process. Following the aforementioned ABC methodology, the cost of each eliminated (or reduced) activity has been determined, which will be a direct factor in calculating the present value of the aggregate savings that will be realized.

For the purposes of this study, activities and cost elements will be defined as follows, sorted by the responsible organization:

### DATA SPECIALISTS (TI)

TI is primarily responsible for assembling the TDPs, which before TeDS was performed by creating individual packages to be sent to each potential vendor. Each of these packages contained a CD and supporting paper documentation. With TeDS, the TDP is posted on the web, thus eliminating the need for CDs. The time required to perform these activities was calculated to be 1880 hours per year, or approximately 0.9 FTE. The resulting labor and material savings are as follows:

| GS-Grade | Base Salary* | Fully-Burdened** | Total Allocation | Present Value*** |
|---|---|---|---|---|
| GS-7 | $28,404 | $34,085 | 0.9 FTE | **$770,185** |

* *Salaries are taken from the General Schedule using Step Five for each grade, and the salary is adjusted by the "Rest of U.S." Locality Pay.*

** *The OC-ALC fully-burdened salary was estimated to use a 1.2 multiplier to capture all fringe and benefits costs for OC-ALC personnel.*

*** *Per OMB Circular A-94, PV is calculated using a 7% discount rate. Where applicable, a 3% inflation rate is utilized.*

Other Direct Costs, specifically CDs and sleeves used for packaging:

| Use | Item | Annual Use | Unit Price | Total Cost | Present Value* |
|---|---|---|---|---|---|
| TDPs | CD-ROMs | 21,600 | $1.25 | $27,000 | $462,857 |
| | CD Sleeves | | $0.25 | $5,400 | |
| Public Sales | CD-ROMs | 960 | $1.25 | $1,200 | $20,571 |
| | CD Sleeves | | $0.25 | $240 | |
| **Total** | | **22,560** | **-** | | **$483,429** |

* *Per OMB Circular A-94, PV is calculated using a 7% discount rate. Where applicable, a 3% inflation rate is utilized.*

Additionally, the cost of replacing the CD writer will be eliminated. The machine currently in use was approximately $100,000 at the time of purchase four years ago. Using a standard five-year replacement schedule (in perpetuity), the savings can be quantified as follows:

| Item | Unit Price | Present Value* |
|---|---|---|
| CD Writer | $100,000 every five years, with first occurrence at end of year 1 | **$232,164** |

* *Per OMB Circular A-94, PV is calculated using a 7% discount rate. Where applicable, a 3% inflation rate is utilized.*

## PROCUREMENT (PK)

The major savings in PK are the elimination of the costs associated with assembling and mailing TDPs to vendors. Prior to implementation of TeDS, a team of 10 GS-7s was responsible for this activity, all but two of whom have since been reassigned. While it is possible that the remaining two will eventually be reassigned as well, these calculations will assume that the will not for the short term. The original 10 FTE will immediately decreased to two, and will then be decreased to zero beginning in year three.

The resulting labor and material savings are as follows:

| GS-Grade | Base Salary* | Fully-Burdened** | Total Allocation | Present Value*** |
|---|---|---|---|---|
| GS-5 | $22,931 | $27,517 | 8 FTE, beginning in year 1 | **$5,503,440** |
| GS-5 | $28,404 | $34,085 | 2 FTE, beginning in year 3 | **$1,294,868** |
| **Total** | | | | **$6,798,308** |

* *Salaries are taken from the General Schedule using Step Five for each grade, and the salary is adjusted by the "Rest of U.S." Locality Pay.*

** *The OC-ALC fully-burdened salary was estimated to use a 1.2 multiplier to capture all fringe and benefits costs for OC-ALC personnel.*

*** *Per OMB Circular A-94, PV is calculated using a 7% discount rate. Where applicable, a 3% inflation rate is utilized.*

Other Direct Costs, including reproduction costs and postage for the mailing of TDPs:

| Item | Annual Use | Unit Price | Total Cost | Present Value* |
|---|---|---|---|---|
| Reproduction Costs | 108,000 | $0.03 | $3,240 | $81,000 |
| Postage | 21,600 | $1.30 | $28,080 | $702,000 |
| **Total** | | | | **$783,000** |

* *Per OMB Circular A-94, PV is calculated using a 7% discount rate. Where applicable, a 3% inflation rate is utilized.*

## NET PRESENT VALUE AND RETURN ON INVESTMENT

The following tables illustrate the aggregate return on investment, with negative figures representing costs and positive figures representing returns:

| Costs | Description | Present Value |
|---|---|---|
| Development | TeDS system development and implementation | $435,000 |
| Hardware | Hardware costs directly associated with TeDS implementation | $292,216 |
| Maintenance | System maintenance | $625,000 |
| System Administration | Labor for system administration | $377,910 |
| **Total** | | **$1,730,126** |

* *Per OMB Circular A-94, PV is calculated using a 7% discount rate. Where applicable, a 3% inflation rate is utilized.*

| Returns/Saving | | Description | Present Value |
|---|---|---|---|
| TI | Labor | CD creation and associated activities | $770,185 |
| | ODCs | CDs and sleeves | $483,429 |
| | Indirect Costs | CD writer | $232,164 |
| | Subtotal | | **$1,485,778** |
| PK | Labor | Mailing labor | $6,798,308 |
| | ODCs | Reproduction and postage | $783,000 |
| | Subtotal | | **$7,581,308** |
| **Total** | | | **$9,067,086** |

* *Per OMB Circular A-94, PV is calculated using a 7% discount rate. Where applicable, a 3% inflation rate is utilized.*

## COST-BENEFIT SUMMARY

The resulting aggregate financial returns can be expressed as follows:

| | |
|---|---|
| **Total Present Value of Returns** | **$9,067,086** |
| **Net Present Value** | **$7,336,960** |
| **Return on Investment** | **424%** |

| | |
|---|---|
| **CUSTOMERS AND USERS** | **Goal:** To implement a new, more efficient process that also increases the satisfaction of internal and external customers.<br><br>**Return**: The perspectives of the different stakeholders using TeDS will be expressed in terms of improvement to user-specific functions and operations |

This section highlights some of the important benefits of the TeDS implementation at OC-ALC that are not necessarily quantifiable. Throughout our interviews, we were careful to determine the impact that the new system had on the process owners—that is the key players involved in the procurement process at OC- ALC. As we mapped out their present process vs. the new process using TeDS we were able to obtain their candid opinion on TeDS and the new process. While still in its inaugural phase, the Data Specialists and the Buyers both recognized some minor problems with TeDS that they expected to be remedied in the upcoming months. Given that future implementations would benefit from these lessons learned, we can only expect a similar if not more enthusiastic response to TeDS at other ALCs.

There were two groups of process owners that we interviewed at the OC-ALC. These included Data Specialists, who are in charge of the front-end of the process, including activities such as pushing the data or loading it on to the CD's and preparing the packages for the buyers. The second group, the Buyers, is responsible for selecting the vendors for each TDP. They also perform quality-control checks on the data that will be sent to these vendors, and after a review of all the bids, ultimately choose the vendor that will be awarded the government contract. Support from these internal stakeholders can also help DoD boost employee satisfaction thereby reducing turnover rate. Although we have not been able to associate numbers with this benefit, maintaining a steady workforce can add even more cost savings by reducing the costs of hiring and training new employees.

## DATA SPECIALISTS

The Data Specialists in general were very much in favor of TeDS. Although they cited several systems problems, such as slow connections with the server and the "timing-out" when pushing large amounts of data onto the server, they still noted the increased efficiency in their procurement tasks with the implementation of TeDS. Even with TeDS operating at a slower pace than it will in the future, it still helps to reduce the cycle time from the Data Specialists' perspective. More detailed explanation of this time-savings was explained in Part B, the Financial section. Because the data needs only to be pushed on to the server one time for each TDP, Data Specialists are saved the time spent burning the multiple CDs that were mailed to the each vendor in the old process. In addition, when a buyer sends a request to change the data on a TDP, they simply need to make the corrections or additions and reload the data on to the server with TeDS. In the old system, this process would involve discarding all CDs and re-burning new CDs with the correct information. Although the Data Specialists whom we spoke with noted that this scenario was relatively infrequent, this feature of TeDS highlights how the system helps to increase efficiency, reduce cycle time and increase the

quality of data contained on the TDPs. With TeDS, there is no need to be concerned about "version" control for TDP data.

## BUYERS

Although the buyers will realize less of a time-savings than the Data Specialists, the buyers whom we spoke with at OC-ALC noted that TeDS facilitated their job. One area where TeDS helped the buyer is in the quality-control process of TDP data. Presently, they must manually check the CDs in a batch with the paper documents that detail the specifications for the solicitation. This is a very time-consuming, manual process. Although the buyers still must check in the information on TeDS, because the documents with the specifications are also located on the server, they are able to complete this check more efficiently. In addition, they will no longer have to specify specific vendors for each TDP; rather, they need only to classify the information and TeDS will automatically screen the vendors and only release sensitive information to those vendors who meet the government's requirements. Although buyers noted some system problems with this functionality of TeDS, they noted that this problem would soon be remedied. Buyers also cited that moving this process online would eliminate some of their wait-time in the present process. This NVA time was quoted at 4-5 days for each TDP.

In addition, buyers will be able to conduct automated vendor searches. By requiring each vendor to register with TeDS, buyers will be able to better track vendor information. Again, buyers noted some difficulties with the system when searching for vendor names, etc. Buyers at OC-ALC were interested in getting this working as soon as possible, but were supportive of the need to work out of these problems with TeDS.

## VENDORS

There is no question that the vendor community will benefit tremendously from the implementation of TeDS. After registering, vendors will have access to TeDS and therefore be able to download TDPs at their convenience. They will no longer have to wait for CDs in the mail. This will reduce the cycle time for the vendor, which should then in turn lower their bid prices to the government. Having TDPs available online is especially beneficial because of the time-constraints that many vendors faced to put together a response to the government solicitation. In addition, TeDS allows some of the smaller vendors to have a fair opportunity to submit their bids for a government solicitation. This increased competition promised to yield cost savings to the government. Competition is one of the driving forces of Capitalism, and an increase in competition promises to lower bid prices. In addition, the procurement process with TeDS shifts responsibility from the government to the vendor. This is a good business practice, and one utilized by the private sector. The vendors should be more proactive about going after their business, and it should not be wholly the government's responsibility to make sure that vendors receive the information necessary to bid on a solicitation. This shared responsibility adds integrity to the overall process, and reduces the cycle time.

Vendors are responding favorably to the implementation of TeDS. Since the program went "live" on October 20, 2000, **over 80 vendors have registered** to use TeDS. Through increased communications in the vendor community, we expect this number to increase

exponentially. Approximately **five new vendors register for TeDS each week** indicating overwhelming support for TeDS from the vendor community.

# VI. CONCLUSIONS AND RECOMMENDATIONS

The returns realized through the implementation of TeDS at OC-ALC have been quite positive. So far, the present value return on the TeDS system is 7.34 million dollars through a full implementation at OC-ALC (and far greater amounts if implemented Air Force- or DoD-wide). In addition, TeDS makes significant strides to help the government realize its goals of paperless contracting, moving to the e-environment and an efficient, streamlined procurement process.

We must also recognize that this pilot program is still in its initial testing phase; it was rolled out October 20, 2000. We are noting all of the minor systems problems that have been encountered thus far, preparing for future roll-out of the program. TeDS has the potential to yield far greater returns in a larger-scale implementation. The initial investments will be reduced since the program and software have already been developed and customized for the ALCs. In addition, we will only improve the implementation through the lessons learned from OC-ALC.